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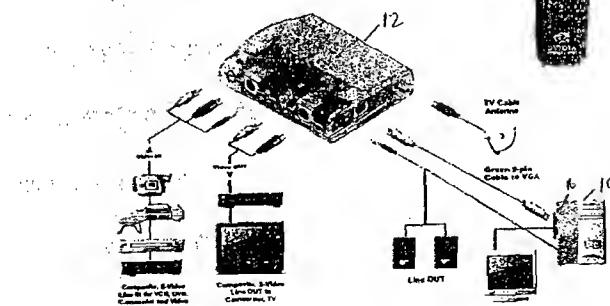
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(54) Title: REMOTE CONTROL DEVICE FOR USE WITH A PERSONAL COMPUTER



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(57) Abstract: Aspects for remotely controlling audio/visual (A/V) devices with a personal computer (PC) are described. The aspects include providing connection hardware for connecting a plurality of A/V devices to a PC. A remote control device with selectable buttons is provided for transmitting data signals wirelessly to the connection hardware. The plurality of A/V devices are controlled according to the data signals from button selections on the remote control device. Through the present invention, a multi-function wireless remote is disclosed which allows for full command of a plurality of A/V devices in a PC, such as a DVD player, TV receiver, Digital Video Recorder (DVR), and electronic programming guide. In this manner, PC users are ensured of a simplified and intuitive interactive PC/video experience.

remote control utilized in such a way with a PC does not typically allow for a variety of options to be controlled as well as providing for options related to other devices such as camcorders, video game consoles, TV, etc., that a PC could be coupled thereto or included therein. Accordingly, heretofore, a remote control could only be utilized with one device and could not be utilized to control other devices either attached thereto or provide thereby via software.

A need remains for a remote control device offering more universal control capability of multiple audio/visual components provided via a PC. The present invention addresses such a need.

SUMMARY

Aspects for remotely controlling audio/visual (A/V) devices with a personal computer (PC) are described. The aspects include providing connection hardware for connecting a plurality of A/V devices to a PC. A remote control device with selectable buttons is provided for transmitting data signals wirelessly to the connection hardware. The plurality of A/V devices are controlled according to the data signals from button selections on the remote control device.

Through the present invention, a multi-function wireless remote is disclosed which allows for full command of a plurality of A/V devices in a PC, such as a DVD player, TV receiver, Digital Video Recorder (DVR), and electronic programming guide. In this manner, PC users are ensured of a simplified and intuitive interactive PC/video experience. These and other advantages of the present invention will be more readily

understood in conjunction with the following detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a perspective view of a personal cinema system with remote control access.

Figure 2 is a simple block diagram of the key components of the personal cinema in accordance with the present invention.

Figure 3 is a flow diagram for remotely controlling a plurality of audio/visual devices by a remote control device utilizing a personal computer system.

Figure 4 illustrates a view of the remote control device with button mapping in accordance with a preferred embodiment of the present invention.

Figure 5 illustrates an example translation mechanism in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION

The present invention relates generally to personal computer systems and more particularly to remote control devices for use with personal computer systems that include multiple A/V (audio/visual) devices. The following description is presented to enable one of ordinary skill in the art to make and use the invention and is provided in the context of a patent application and its requirements. Various modifications to the preferred embodiment and the generic principles and features described herein will be readily apparent to those skilled in the art. Thus, the present invention is not intended to

be limited to the embodiment shown but is to be accorded the widest scope consistent with the principles and features described herein.

In accordance with the present invention, a remote control for a PC is provided that has the capability to control multiple A/V devices in an integrated fashion. A preferred embodiment is described with reference to a Personal Cinema system available from Compro Technology, Inc. of Dong Guan City, China.

Figure 1 illustrates a perspective view of personal cinema system 9 with remote control access. The personal cinema system 9 includes a PC 10, a tuner box 12, and a remote control 14. Included in the PC 10 is a graphics card 16 that is connected via a cable to the tuner box 12. In a preferred embodiment, the tuner box 12 supports connections to multiple audio/visual (A/V) devices, including DVR, DVD, Camcorder, Video Game Console, TV, etc., as shown. Thus, the tuner box 12 and graphics card 16 provide the connection hardware for the multiple A/V devices to the PC 10. Further included in the tuner box 12 is an infrared (IR) port that receives IR signals sent by the remote control 14. Thus, the remote control 14 provides a wireless link for the user to the graphics card 16 and its associated programming in the PC.

In this manner, the remote control 14 of the present invention provides a single device with which the user can control the multiple A/V devices associated with a PC. In a preferred embodiment, the universal nature of the remote control 14 is achieved through a mapping of the button of the remote control to the different devices. To further describe this feature, please refer now to the following description.

Figure 2 is a simple block diagram of the key components of the personal cinema in accordance with the present invention. As is seen, the remote control 14 sends a signal

(preferably infrared) to a register 108 within the tuner box 12. The register 108 provides data to a graphics processor unit (GPU) 102. The GPU 102 includes a software driver 104 that provides information for controlling the various A/V devices. The driver 104 provides the data to a button mapping software 106 that handles the various A/V devices that are in software within the PC. In this embodiment, a TV receiver 109, a DVD player 110, a DVR 112 and a CD player 114 are the A/V devices controlled by the remote control 14. However, it should be readily understood by one of ordinary skill in the art that although specific A/V devices are shown, a variety of devices can be utilized and their use would be within the spirit and scope of the present invention.

Figure 3 is a flow diagram for remotely controlling a plurality of A/V 104 devices by a remote control device utilizing a personal computer system. Referring now to Figures 1, 2 and 3 together, the remote control 14 sends a data signal/binary code to the tuner box 12 in response to a button selection, via step 20. The register 108 in the tuner box 12 within is used to receive the data signal for transfer to the graphics card 16, e.g., for example via an I2C bus. The data signal is then translated via the button mapping software to the appropriate control function 16, via step 22.

Thereafter, the appropriate control function is controlled within the PC, via step 24. For example, the application programming may include TV receiver programming, DVD player programming, DVR programming, and CD player programming as individual programs or alternatively, integrated programming, as is well appreciated by those skilled in the art. Thereafter, the button that controls the function can be activated, e.g., power ON/OFF, fast forward, record, etc., via step 26. By way of example, a look-

up table provides a translation mechanism suitable for determining a function associated with activating a button of the remote control 14.

Figure 4 illustrates a more detailed view of the remote control 14 and button numbers assignment. As is seen, buttons 0-9 provide channel numbers for the remote control and buttons 10-31 control various functions for the various A/V devices. As is also seen, the DVD/CD functions are controlled together and the TV/DVR functions are controlled together. Accordingly, as is seen, in this embodiment, button 10 controls the CD/DVD on/off function and the button 11 controls the TV/DVR on/off function. Accordingly button 11 has no effect if the CD/DVD function is on and button 10 has no effect if the TV/DVR function is on. As is further seen, the CD/DVD functions and TV/DVR functions (i.e., DVD root menu/EPG (button 12), DVD language select/video source select (button 13), enter/playlist (button 14, etc.) are controlled by pressing the buttons after function button 10 or 11 is pressed. As has been before mentioned, the control of the A/V devices is handled by button mapping software which translates the data signal from the remote control via the software driver 104. In a preferred embodiment, this translation is performed by utilizing a look-up table that associates a particular button with a particular function.

Figure 5 illustrates an example of a look-up or translation table that associates a button number (keys) with the data signal/action key code (IR code) for each function necessary for DVR and DVD programming. As is seen, the pressing of each button provides a unique IR code. Each of the IR codes initiates a particular action. As above mentioned, buttons 0-9 have IR codes (0xx00 - 0xx09) that relate to the channel numbers for the remote control. Also as above mentioned, button 10 initiates the

CD/DVD function via a specific IR code (0xx09). Buttons 12-31 thereafter provide specific functions via the IR codes (0xx12-0xx31) related to the CD/DVD function. Similarly, button 11 initiates the TV/DVR function, via a specific IR code (0xx10). Buttons 12-31 thereafter provide specific functions via the IR codes (0xx12-0xx31) related to the TV/DVR functions.

It should be understood that although a particular translation or look-up table with particular buttons providing specific IR codes is shown, it is illustrative only, and one of ordinary skill in the art readily recognizes that a variety of tables and IR codes could be utilized and their use is within the spirit and scope of the present invention. Accordingly, as is seen, utilizing the button mapping translation via a spreadsheet or other translation mechanism, the control of the different A/V devices in the PC can be provided utilizing one remote control.

Through the present invention, a multi-function wireless remote is disclosed which allows for full command of a plurality of A/V devices in a PC, such as a DVD player, TV receiver, Digital Video Recorder (DVR), and electronic programming guide. In this manner, PC users are ensured of a simplified and intuitive interactive PC/video experience. Although the present invention has been described in accordance with the embodiments shown, one of ordinary skill in the art will readily recognize that there could be variations to the embodiments and those variations would be within the spirit and scope of the present invention. Accordingly, many modifications may be made by one of ordinary skill in the art without departing from the spirit and scope of the appended claims.

CLAIMS

What is claimed is:

1. A method for remotely controlling audio/visual (A/V) devices within a personal computer (PC), the method comprising the steps of:
 - (a) mapping each button on a remote control device to predetermined key codes; and
 - (b) translating data signals from a selected button to device functions via the PC based on the key codes to control operations of a plurality of A/V devices coupled to the PC.
2. The method of claim 1 further comprising the step of:
 - (c) utilizing the look-up table to provide associations between the predetermined key codes and the device functions.
3. The method of claim 2 wherein the utilizing of the look-up table step (c) further comprises the step of (c1) providing a button mapping code in the PC.
4. The method of claim 2 wherein the device functions further comprises a plurality of CD/DVD and TV/DVR functions.
5. A system for remotely controlling a plurality of audio/visual (A/V) devices within a personal computer (PC), the system comprising:

a PC;
connection hardware coupled to the PC; and
a remote control device with selectable buttons for transmitting data signals
wirelessly to the connection hardware to access control of the plurality of A/V devices.

6. The system of claim 5 wherein the connection hardware further comprises a tuner box.

7. The system of claim 5 wherein the connection hardware further comprises a graphics board in the PC coupled to the tuner box.

8. The system of claim 5 further comprising an infrared port receiver in the connection hardware to receive the data signals from the remote control device.

9. The system of claim 7 wherein the graphics board translates the data signals to a button number.

10. The system of claim 5 further comprising an application driver programming in the PC that utilizes the button number to determine an action key code in one of the plurality of A/V devices.

11. The system of claim 10 wherein the action key code further comprises one of a plurality of DVD and DVR functions.

12. A method for remotely controlling a plurality of audio/visual (A/V) devices within a personal computer (PC) utilizing a remote control, the remote control having a plurality of buttons, the method comprising the steps of:

- (a) providing a data signal based upon activating at least one of the plurality of buttons from the remote control, the at least one button for controlling one of the plurality of A/V devices; and
- (b) translating the data signal to control one of the plurality of A/V devices.

13. The method of claim 12 wherein the data signal translation comprises providing one of a plurality of CD/DVD and TV/DVR functions.

14. A computer readable medium containing program instructions for remotely controlling audio/visual (A/V) devices within a personal computer (PC), the program instructions for:

mapping each button on a remote control device to predetermined key codes; and translating data signals from a selected button to device functions via the PC based on the key codes to control operations of a plurality of A/V devices coupled to the PC.

15. The computer readable medium of claim 14 further comprising utilizing a look-up table to provide associations between the predetermined key codes and the device functions.

16. The computer readable medium of claim 15 wherein utilizing a look-up table further comprises providing a button mapping code in the PC.

17. The computer readable medium of claim 15 wherein the device functions further comprises a plurality of CD/DVD and TV/DVR functions.

18. A system for remotely controlling a plurality of audio/visual (A/V) devices within a personal computer (PC), the system comprising:

a PC;

a tuner box coupled to a graphics board within the PC; and

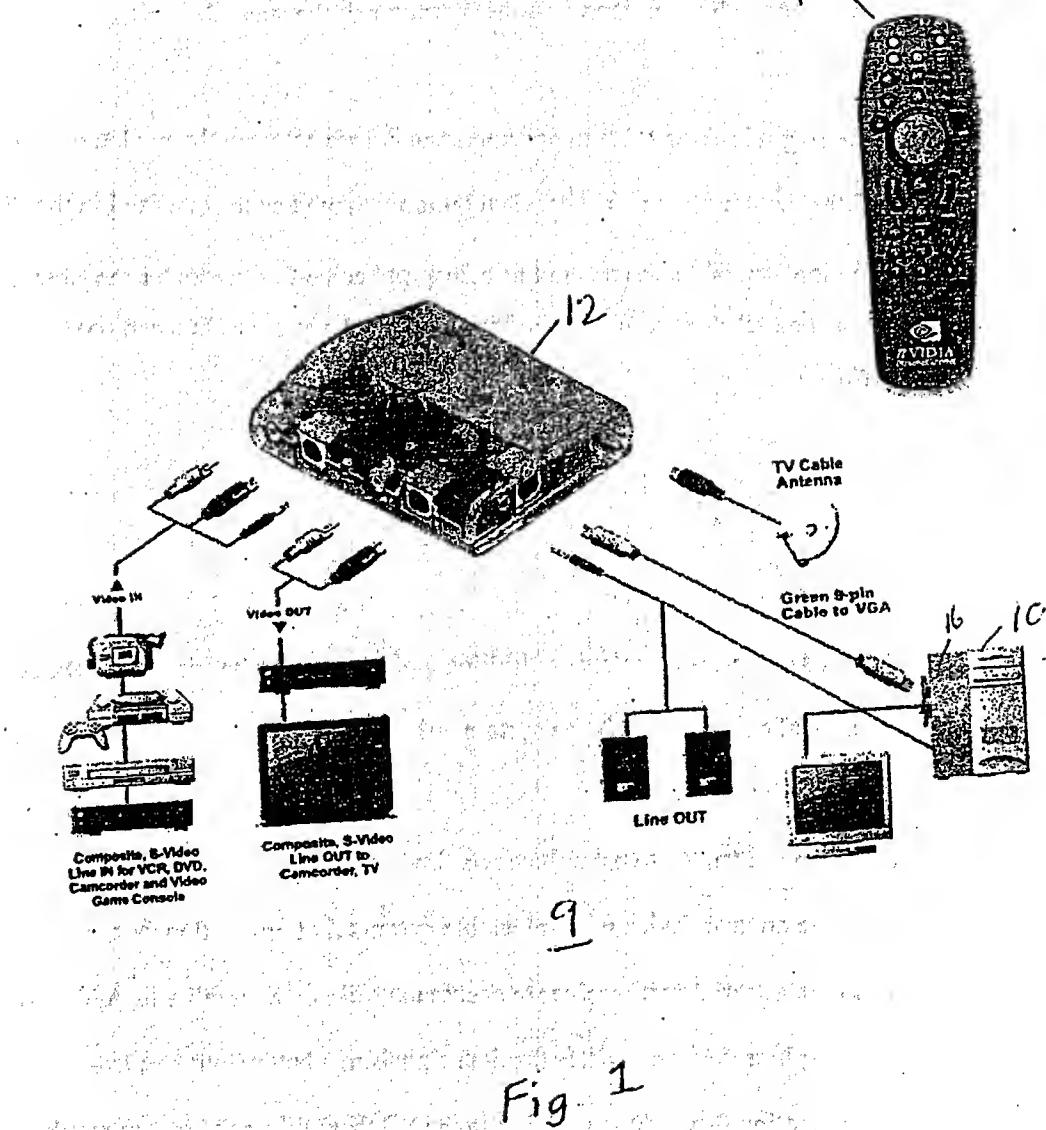
a remote control device with selectable buttons for transmitting data signals wirelessly to the tuner box to access control of the plurality of A/V devices, wherein the graphics board translates the data signals to a button number.

19. The method of claim 1 further comprising the step of:

utilizing a look-up table to provide associations between the predetermined key codes and the device functions, wherein a button mapping code is utilized in the PC to provide the look-up table, the method of being applicable to a computer readable medium for remotely controlling audio/visual (A/V) devices within a personal computer (PC)

20. A system for remotely controlling a plurality of audio/visual (A/V) devices within a personal computer (PC), the system comprising:

an infrared port receiver;
a tuner box coupled to a graphics board within the PC;
a remote control device with selectable buttons for transmitting data signals wirelessly to the infrared port receiver to access control of the plurality of A/V devices wherein the graphics board translates the data signals to a button number; and
an application driver programming in the PC that utilizes the button number to determine an action key code in one of the plurality of A/V devices.



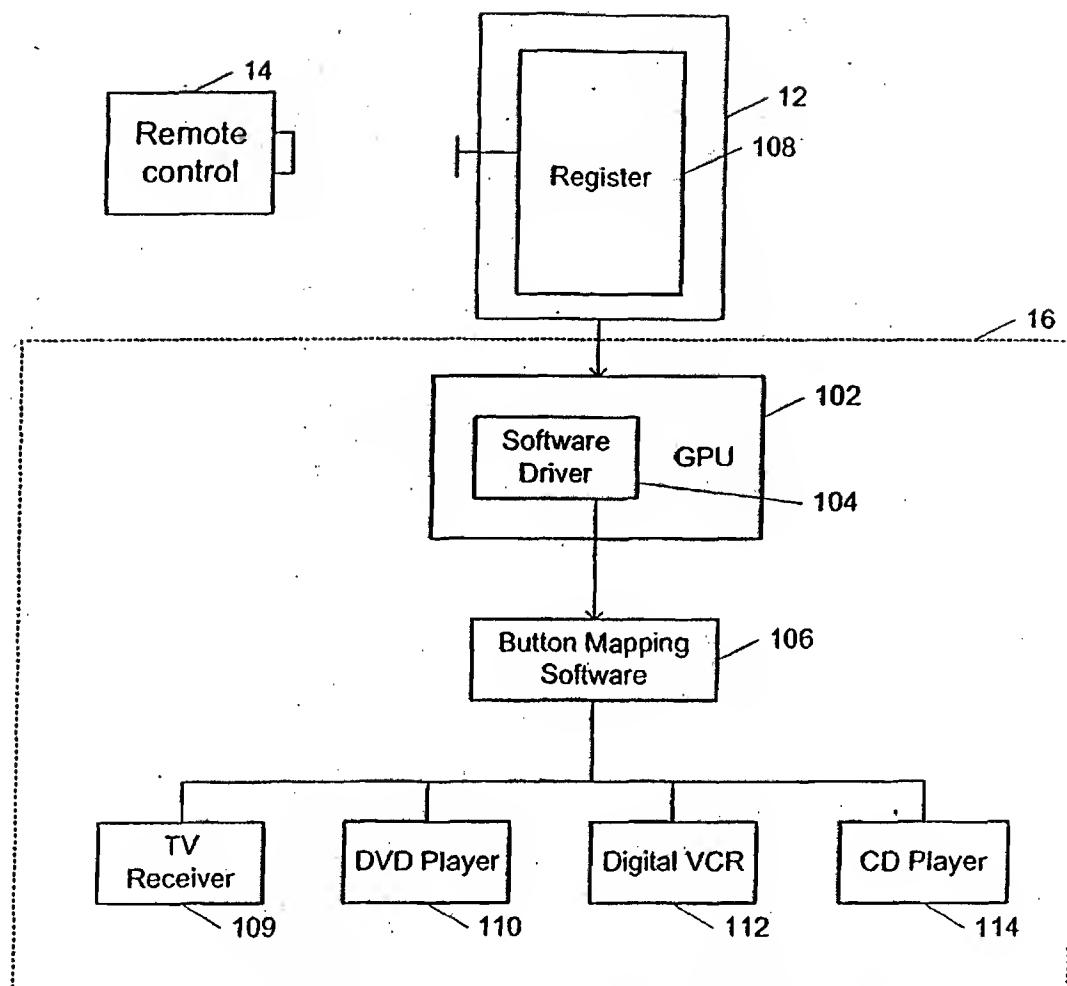


Fig. 2

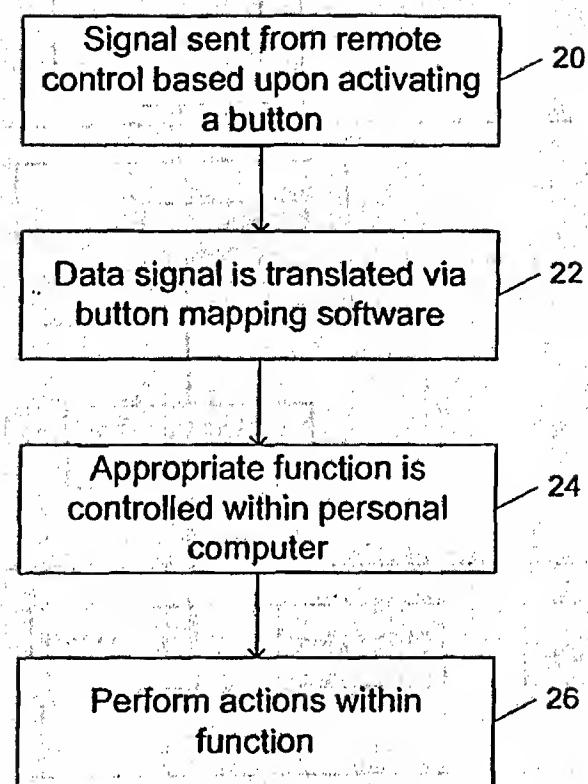


Fig. 3

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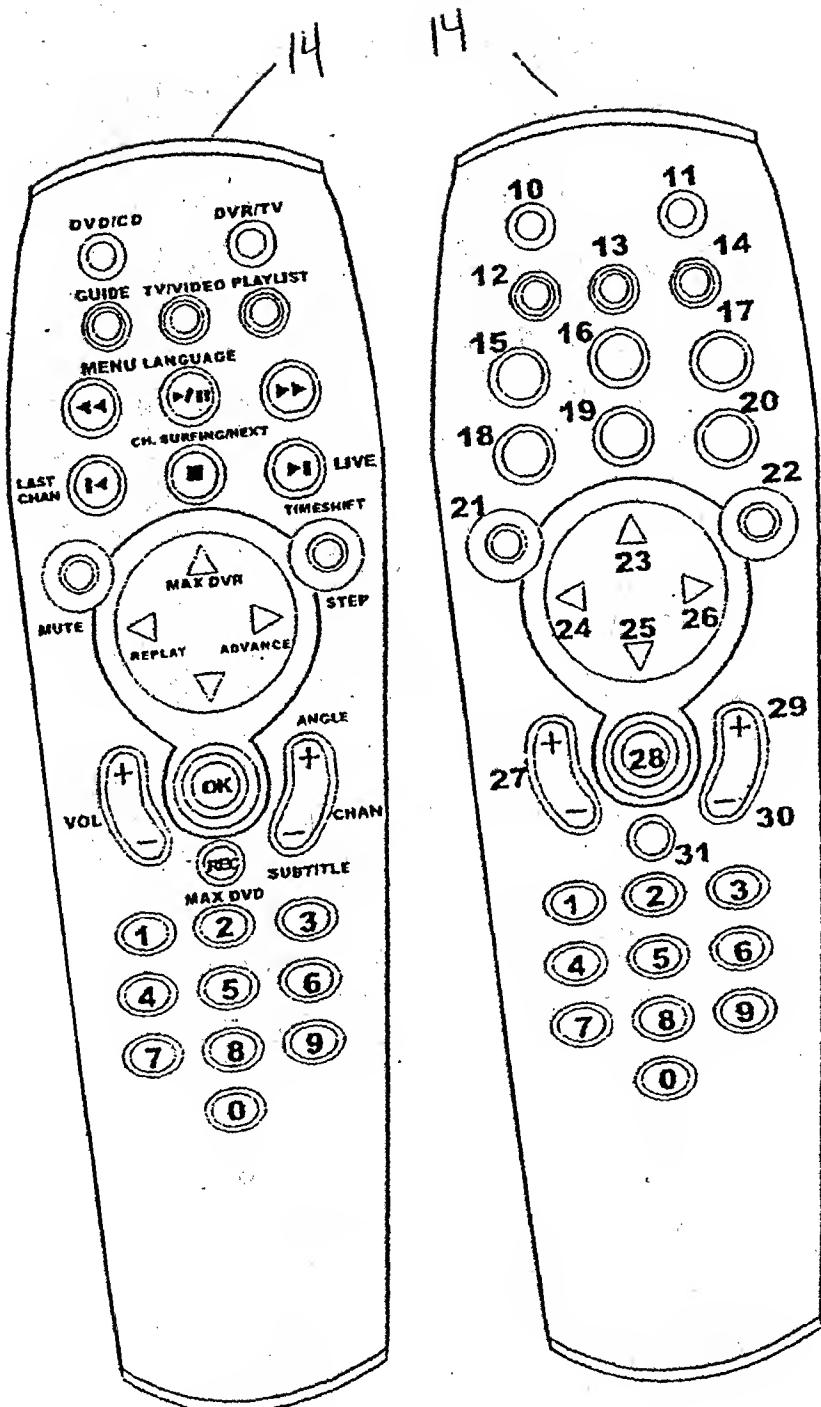


Fig. 4

Keys	IR Code	DVD/CD Function	DVR Function
0-9	0x00-0x08	Number keys	Number keys
10	0x09	CD/DVD On/Off	N/A
11	N/A	N/A	TV/DVR On/Off
12	0x11	DVD Root Menu	EPG
13	0x12	DVD Language Select	Video Source Select
14	0x13	Enter	Playlist
15	0x14	Rewind	Rewind
16	0x15	Play/Pause	Play/Pause
17	0x16	Forward	Forward
18	0x17	Jump to previous chapter	Jump to last channel
19	0x18	Stop (Next)	Stop (Next) (Channel surfing)
20	0x19	Jump to next chapter	Go to Live TV while in Timeshift mode
21	0x20	Mute	Mute
22	0x21	Step in movies playing	Timeshift mode-enable TIVO-like functions
23	0x22	Up arrow	Full Screen TV toggle
24	0x23	Left arrow	Instant replay
25	0x24	Down arrow	Down arrow
26	0x24	Right arrow	Commercial Advance
27	0x26	Volume adjustment	Volume adjustment
28	0x27	OK>Select	OK>Select
29	0x28	DVD angle select	Channel up
30	0x29	DVD subtitle select	Channel down
31	0x30	Full Screen DVD toggle	Record

Fig. 5